T10D06 – Distillation Activity

Name _____

As you are now aware, crude oil can be separated into its parts based on the boiling point of the hydrocarbons. Short chains such as methane (CH_4) have a boiling point so low that it is a gas at ambient room temperature (25°C), making them very volatile due to their low molar mass and limited intermolecular forces. Other long chains of hydrocarbons are thick, black, viscous, and remain as very heavy liquids due to their long chains of carbons (up to 100's long) and increased intermolecular forces of attraction between them.

Today you will separate two liquids using a simple distillation apparatus similar to the one shown below in Figure 1. Emphasis in the lab should be put on the technique and proper handling of equipment rather than results, although you will collect a few.

You will use a water bath and hot plate in the place of the Bunsen burner

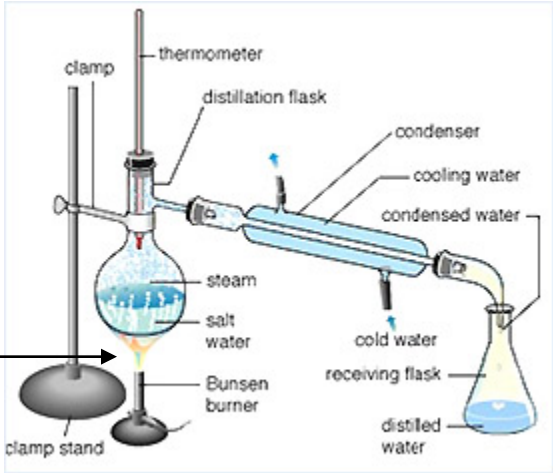

Figure 1. Simple Distillation Apparatus

Although this set up is not nearly precise enough to separate crude oil into its individual hydrocarbons, it will give you the idea of the process and can be used to separate two liquids of a boiling point difference of at least 80°C. Or more commonly the simple distillation can be used to separate liquids from solid dissolved particles, such as the purification of water from its dissolved ions such as fluorine, chlorine, sodium, potassium, etc.

What are you graded on? Standard 12 – Manipulative Skills: For this reason it is extremely important that you handle all materials with care, closely following verbal directions of your teacher.

The two liquids you will be separating are Aniline (BP 183.13°C) and Ethanol (BP 78.4°C). You will find that the ethanol (which is clear) will evaporate first, it is extremely important that not overheat the solution.

Good luck, and please, take your time and be sure to ask questions!